

number contains some papers worthy of attention, among others, "A Critical Study of the Fevers of Algiers," by Dr. Angei Murraud; "Considerations on the Herbaceous Plants of the Summer Flora of Algiers," by M. J. A. Ballandito; and a lecture on "The General Phenomena of Reproduction among Vegetables," by M. F. Trabut.

THE post of *astronome titulaire* to the Paris Observatory having been declared vacant, the Minister of Public Instruction has decided upon following for the first time the prescriptions of an old decree of 1852, declaring that the Minister should only have the faculty to appoint one of the persons whose name should have been inscribed on either of two lists, written one by the Academy of Sciences and the other by the Astronomical Board of the Observatory. The list of the Board has been sent to the Minister with the name of M. Perrigault in the first line and Leveau in the second. The Section of Astronomy has submitted to the Academy a list containing Perrigault in the first line and Leveau and Perrotin in the second. The Academy will vote at its next sitting on these conclusions.

THE additions to the Zoological Society's Gardens during the past week include a Grivet Monkey (*Cercopithecus griseo-viridis*) from North-East Africa, presented by Mr. H. E. Laver; a Common Marmoset (*Hapale jacchus*) from South-East Brazil, presented by Madame Sparagnapane; a Persian Gazelle (*Gazella subgutturosa*) from Persia, presented by Mr. W. Dunt; a Golden Eagle (*Aquila chrysaetos*), European, presented by the Viscount Hill; a Horrid Rattlesnake (*Crotalus horridus*) from Aracati, Brazil, presented by Mr. Karl J. Schmettan; a Red-fronted Lemur (*Lemur rufifrons*) from Madagascar, a Guilding's Amazon (*Chrysotis guildingi*) from St. Vincent, W.I., eight Golden Plovers (*Charadrius pluvialis*), European, purchased; four Wild Swine (*Sus scrofa*) born in the Gardens.

OUR ASTRONOMICAL COLUMN

MINOR PLANETS.—The circulars of the *Berliner astronomisches Jahrbuch* prove that Prof. Tietjen is using great exertion to keep pace in calculations with the rapid discoveries of small planets; the latest circular contains elements and an ephemeris of No. 212 detected at Pola on February 6. The actual number is now 214, the last having been discovered also by M. Palisa at Pola on March 1.

THE SOUTHERN COMET.—Approximate positions of the large comet first remarked in South Africa on February 1, deduced from observations at the Royal Observatory at the Cape on each evening from February 10-15 inclusive, were received from Mr. Gill by last mail. The right ascensions were given to minutes of time only, the corresponding north polar distances to minutes of arc, but the motion of the comet in R.A. being pretty rapid it has been possible to found elements upon the Cape places, which will afford an idea of the true orbit, and indeed which represent the observations on the six evenings as nearly as could be expected under the circumstances. The elements are as follow:—

Perihelion passage, 1880, January 26.4559 G.M.T.

Longitude of the perihelion	255° 47' 2"
" ascending node	332° 25' 0"
Inclination	46° 38' 6"
Logarithm of the perihelion distance	8.59917
Heliocentric motion—retrograde.	

This orbit represents the observed places with the following differences:—

	R.A.	N.P.D.
February 10	0° 0'	0° 0'
11	- 4' 7"	+ 0' 4"
12	+ 1' 6"	+ 0' 1"
13	+ 2' 4"	+ 1' 4"
14	+ 10' 7"	+ 1' 1"
15	0° 0'	0° 0'

Calculating for 8h. 30m. mean time at the Cape Observatory we

have the subjoined positions, during the period that the comet, so far at least as regards its lengthy train, appears to have attracted so much attention in the other hemisphere:—

	R.A.	N.P.D.	Distance from the Sun.	Distance from the Earth.	Intensity of light.
Jan. 30 ...	314° 3'	113° 40'	0.237 ...	0.768 ...	30.3
Feb. 1 ...	320° 59'	116° 55'	0.322 ...	0.709 ...	19.2
3 ...	329° 2'	119° 42'	0.399 ...	0.671 ...	14.0
5 ...	337° 54'	121° 51'	0.469 ...	0.649 ...	10.8
7 ...	347° 12'	123° 13'	0.535 ...	0.641 ...	8.5
9 ...	356° 25'	123° 44'	0.597 ...	0.647 ...	6.7

The above orbit will barely suffice to indicate the comet's actual positions within narrow limits; for March 19, at 8 P.M., the computed right ascension is 4h. 16m., and the north polar distance 104°, which places the comet above our horizon after sunset, but the intensity of light has diminished to 0.2, which, with the presence of the moon, seems to allow but little chance of observations.

With the elements we have given the comet would be north of the ecliptic less than two days, or from about January 25d. 20h. to 27d. 17h. Greenwich time. The orbit telegraphed from Brazil, apparently on the authority of a note of M. Liais's, differs very widely except in the perihelion distance.

GEOLOGICAL NOTES

GEOLOGICAL SURVEY OF SAXONY.—This well-appointed and well-led body of geologists continues to produce a series of excellent maps, which are issued as chromolithographed sheets, at the price of 2s. Each sheet is accompanied by an explanatory pamphlet, price 1s., in which the geological structure of the ground is made clear to the reader. The contents of the pamphlet are conspicuously printed on the back of the cover. Eight of these sheets and pamphlets have recently been issued, embracing the sections of Colditz, Leisnig, Döbeln, Penig, Waldheim, Burkhardttsdorf, Marienberg, and Elterlein. The area embraced by these publications includes large tracts of gneiss, schist, and other azoic rocks, which are described in great detail in the text. There can be no doubt that this thorough investigation of the Archæan rocks of Saxony will be of great service in future discussions regarding the age and genesis of the crystalline schists.

GEOLOGICAL SURVEY OF INDIA.—Mr. Medlicott, superintendent of this survey, has issued his Annual Report for 1879, from which we learn that in the Peninsular area there were five parties in the field during the past year, while in the extra-peninsular area there were two parties. The map accompanying the report shows that a large area of the Carnatic has been recently mapped and published, and that a wide tract is in progress between Hyderabad and the Bay of Bengal. The maps and reports of another large district in the lower part of the Indus Valley were last year published, as well as several detached areas in the Peshawur and Kashmir regions. The areas completed by some of the surveyors are of wide extent. Thus Mr. Feddes completed the survey of some 1,900 square miles in continuation of his previous season's work, besides making preliminary traverses of adjoining territory. This large piece of ground is almost wholly occupied by eruptive igneous rocks. Mr. Hackett, however, succeeded in adding more than 10,000 square miles to his previous survey of the Arvali region. This region is described as a wide waste of sand with only scattered outcrops of rock. Mr. Medlicott makes in his report an important statement as to the nature and conditions of publication in the office under his charge. He points out that were the issue of the work of his subordinates postponed until it could be thoroughly tested and brought up to the best standard of the time, it would often be indefinitely postponed. He states that such postponement, previous to his appointment, had been the rule, and he cites the case of the description of the Rájmahál hills as an example, this work having actually been delayed for fifteen years, though even at last it is in no important respect better than it would have been had it appeared at once. He considers that the chief duty of the Geological Survey is to the general public, which requires, first of all, an intelligible map and description of areas hitherto geologically unknown. He claims that the least finished work of the Survey fulfils that duty, however imperfectly, and that on the whole it is better, even at the risk of publishing crude material, to give the results forth to the world than to withhold them for an indefinite period until

they can be completed and perfected. This immediate publication likewise removes any cause for discontent on the part of the officers whose labours might be withheld from the public, while at the same time the consciousness that their work will at once be exposed to criticism must naturally act as a stimulus to care and accuracy. Mr. Medlicott adds: "I see no compromise but the one I adopted, and to which I adhere. The risk it obviously implies—the exposure of faulty work—falls upon our own heads. The minor evils it involves are no greater than those it removes, and the smart of public criticism is more wholesome than the heart-burning of official suppression." His efforts at conciliation and usefulness, however, have landed him in another dilemma. Of course he is compelled to make corrections of the publications of the Survey; but the wielding of his editorial pen seems to be now and then resented by some over whose lucubrations it has been displayed. And thus the injured writers, proud of their flowery periods or of their inaccurate geology, rush off to newspaper editors and pour forth their complaints in angry letters! Would it not sometimes be the most fitting punishment to publish the lucubrations just as they are put into the superintendent's hands? One or two glaring cases of this kind would possibly cure the evil, unless the burning sun of India makes a geologist's hide thicker than is usual in our colder clime.

AMERICAN GEOLOGICAL SURVEYS.—Though the various independent geological surveys under different departments of the United States administration were abolished by Act of Congress in June of last year, certain provision was made for the publication of their results. Among the corps embraced in the demolition was that which, under Capt. George Wheeler of the Engineers, had done much good work. From a document just issued, and forming part of the Annual Report of the Chief of Engineers for 1879, we learn that Capt. Wheeler's geologists stuck to their ground almost up to the very day when their appropriations expired. They took the field on May 20 of last year in Colorado and New Mexico, and after a month of hard work the party was disbanded on June 24, six days before the end of the financial year. Prof. J. J. Stevenson of New York, who has been in charge of the Engineer geological explorations in that area, has published a preliminary report in anticipation of the final memoir. It shows that he has accomplished much interesting detail, particularly in regard to the succession of the coal-bearing Laramie series. We trust that he will be able to give satisfactory sections of the Sangre de Christo range, particularly with reference to the structure and age of its metamorphic rocks. He alludes to them in this preliminary report as "archæan." In Hayden's Report of the United States Geological and Geographical Survey of the Territories for 1875 (p. 208) Dr. Endlich concludes that these rocks are metamorphosed Silurian strata; and in the Report of the same Survey for the previous year he presents a similar conclusion with regard to the granite of the San Juan country. Detailed and accurate information on the true stratigraphical relations of the so-called "archæan" rocks of the Rocky Mountains and western ranges of North America are much needed. While referring to American official geological publications we would point out the absolute necessity of reference to the labours of previous explorers. We could pick out not a few otherwise excellent reports which are disgraced by an utter obliviousness of the existence of any earlier writings on the areas described. Without warning or explanation new names are given to formations which had already been named and described. If the original names and descriptions are defective or inaccurate let that be stated. But in common fairness to fellow-labourers, not to speak of duty to the reading public, let us know distinctly whether we are perusing an account of ground that has never been described before, or whether we are merely getting a new rendering of facts already familiar to us. When the history of geological exploration in Colorado comes to be written how many different and rival expeditions will have to be enumerated, and in how many cases will it be found that they have recognised each other's existence!

IMPERFECTION OF THE "GEOLOGICAL RECORD."—Geologists and those who take interest in the literature of Evolution will find some curious papers by Th. Fuchs in recent numbers of the *Verhandlungen* of the Geologische Reichsanstalt of Vienna—apparently the first of a series in which he proposes to demolish Darwinism by accurately compiled statistics. He contends that the assertion of the imperfection of the "Geological Record" rests for the most part on gross exaggeration of the facts. He holds that instead of being, as Darwin and his followers maintain,

full of gaps, the record of the older faunas and floras of the earth is extraordinarily perfect. He contends that Palæontology as it now stands is able, with a properly directed criticism, to afford a perfectly satisfactory basis on which to discuss with confidence the biological questions involved in Darwinism. He points out that in such a discussion it is needful to keep clearly in view a twofold series of animal remains. 1. Those which on account of their fragility, habitat, or habits can only be exceptionally preserved, such as medusæ, ascidians, insects, birds, small mammals, and tender plants. 2. Those with enduring hard parts, which, in consequence of their habitat and habits, are necessarily, in the regular progress of sedimentation, inclosed in new formations, such as corals, echinoderms, molluscs, &c. Admitting the exceptional preservation of the first series as fossils, he maintains that the entombment of those of the second series, so far from being exceptional, is now, and always has been, part of the daily and necessary régime in the formation of sedimentary accumulations, and that in this way the geological record of the past is remarkably complete. To prove or illustrate this contention, he gives a few examples of the kind of "statistical data" on which he relies. For example, in an up-raised bed of marine clay near Messina about 100 species of organisms were found, nearly all still living in the adjoining sea, but including a few that were not known in the existing fauna. Further search of the sea-bottom, however, detected these forms also. "In this case, therefore," says Herr Fuchs, "the fauna of Messina Harbour was more completely known from the fossil than from the living fauna." Again the Tyrrhenian Sea has yielded 337 species of conchiferous shells; of these 300 are found in the quaternary deposits of Leghorn; therefore the fauna of that sea could be with great completeness made out from fossil forms! In a subsequent number of the same journal Herr R. Hoernes has shown the fallacy of this reasoning; but Herr Fuchs has evidently laid in his store of ammunition, and does not mean to be disturbed until he has fired it all off. He continues his broadside in the number of the *Verhandlungen* just received, where he has a paper "On some Fundamental Phenomena in the Geological Development of the Organic World."

GEOGRAPHICAL NOTES

ACCORDING to the last news received from M. Prjevalsky, he reached, on September 12, the boundary of Southern Tsaidam, and thus entered the great highway which leads from China to Tibet. Detailed information as to his journey of last year from Kani to Sha-jeu, appears now in the *Izvestia* of the Russian Geographical Society. Khami is at the extremity of the sandy steppe described as the Mouschoun Gobi; it is a desert, nearly quite deprived of vegetation. For fifty miles are seen only immense spaces of clay covered with gravel; the temperature at the beginning of June reached as high as 38° Cels., and the soil had sometimes a temperature of 68° Cels. Journeying must be done in the night. No large animals, except the antelope and the wild camel, which comes from the deserts of Lob-nor, were seen. M. Prjevalsky crossed this desert in a south-eastern direction for 232 miles, and reached the oasis of Sha-jeu, a very fertile one, being the best tract of Central Asia, after Kulja. A high ridge of mountains covered with snow, the Altyn-tagh of Lob-nor, here joins the Nian-shan of Koko-nor. Thus the question as to the junction of these two systems of mountains is solved definitely. M. Prjevalsky stayed for a month in Sha-jeu, seeking for guides to Tsaidam, and finally he found in the mountains three Mongols who agreed to serve as guides, so that he could reach Tsaidam, going first south-west to Lake Serten and thence to Lake Koko-nor.

THE last number of the Russian *Izvestia* contains an interesting paper, by M. Oshanin, on the upper parts of the Muk-su River, a tributary of Surkhob. These tracts were not previously visited, only one point in the valley of Muk-sou being known to Russian travellers, namely, the grave of Altyn-mazar, situated at the confluence of the Sel-su, Suk-su, and Kainda Rivers. Very high peaks inclose this deep valley, the bottom of which is no less than 8,000 feet above the sea-level. The Sandal peak, which is in the middle of the chain, reaches to no less a height than 25,000 feet, and two other peaks, Shelveli and Muz-jilga, are situated beside it. They are covered for two-thirds of their height with snow, and immense glaciers flow from their wide amphitheatres into the valley of Sel-su and of its tributaries. They form together a glacier which descends very low, its lower extremity, one and a half miles wide, being met with at a distance